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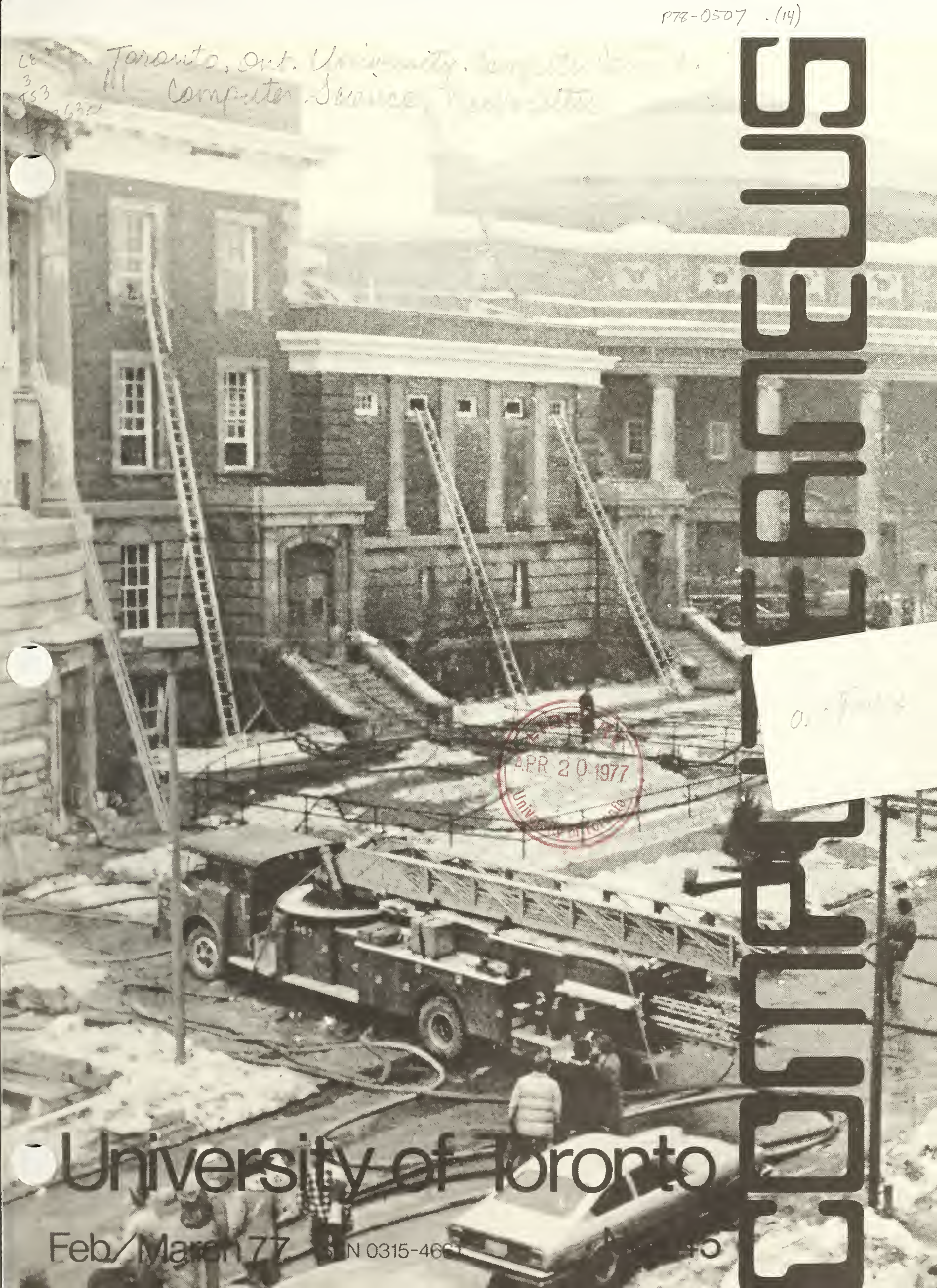

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Janet Campbell, Editor

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ATTENTION COMPUTERNEWS SUBSCRIBERS

The recent fire which demolished most of the Computer Centre's offices in the Sandford Fleming Building necessitated the temporary re-assignment of work priorities. The University of Toronto Computer Centre was unable to publish the February 1977 issue of COMPUTERNEWS. This issue includes the data and information which would have appeared in the February issue as well as the March material. Our apologies to COMPUTERNEWS subscribers.

Photos appearing in this issue of COMPUTERNEWS were provided by:

MIKE GARAMSZEGHY
DOUG LACY
ALEXANDER SOCHANIWSKYJ
KEN WHITEHURST
IAN DARWIN

THANK YOU

There were so many people who offered to help and who worked long hours to restore our computing services during the days that followed the Sandford Fleming fire, that it would be impossible to thank them individually.

A special note of thanks are in order for:

The Toronto Fire Department for a well fought fire. At one time on Friday morning it appeared that the fire could not be brought under control and that the entire Sandford Fleming Building would be lost. Fortunately, the Fire Department was able to control the fire and also prevented potential water damage to the computer equipment by covering the equipment with tarpaulins. Our staff was on hand to ensure that the most expensive components of the system were covered. There was a tendency to cover every card reader, line printer and typewriter keyboard in sight before covering those non-descript boxes sitting on the floor.

The University of Toronto Police, Physical Plant, Computer Centre staff and Dean Etkin who helped us remove our tapes, disks, and "SYSGEN" listings to a safe place in the Engineering Annex while the building was ablaze.

All the Ontario Universities, local computer installations and suppliers who volunteered assistance, computer time, new computer equipment and space the morning after the fire. The response was overwhelming and indeed very gratifying.

Gil Aberto Avila, Bill Clarke, John O'Dell, Tom Prosser, Tom Russel, Don Taylor, Terry Moore, Al Noganobu, Jack Piper, and other staff of IBM Canada who worked all weekend to reconfigure a computer system in Don Mills to meet needs for our interim computer services. New disk drives and console devices were added to the system in record time and two new remote batch terminals were installed in the Arts and Science Undergraduate Terminal area.

Alex Rankin, Vice-President of Business Affairs who magically arranged the installation of new Bell telecommunications lines between the Don Mills computer system and the Erindale, Scarborough and St. George campuses over the weekend.

cont'd...

THANK YOU cont'd

The Computer Centre staff who worked around the clock on the weekend installing our system in Don Mills, preparing and posting user notices and organizing staff so that we could resume production Monday morning. (They deserve special commendations for being able to survive on pizza and Mother's sandwiches).

John McNeil and Physical Plant staff who performed an outstanding job in cleaning up and restoring heat, electrical and air conditioning services to the computer area in the Sandford Fleming Building. Due to their efforts we were back in full production on Saturday morning one week after the fire.

I would like to extend my warmest thanks to all the other members of the University community who lent their support and helped re-establish UTCC services in this remarkably short period of time.

The Computer Centre staff acknowledge with thanks your many letters of appreciation that were received during this period.

Rein Mikkor

A CHANGE IN PLANS

The recent fire in the Sandford Fleming Building has made it necessary for the Computer Centre to adjust its long range plans to upgrade and improve UTCC's facilities and services.

The original plan consisted of three major components:

1. The acquisition of a second 165-II to meet the needs of our administrative users which have outgrown the 155-II computer system. The additional capacity of the new 165-II was to be shared by our academic users.
2. The acquisition of an effective general purpose time-sharing machine for academic use.
3. The consolidation of all three machines in the Sandford Fleming Building.

The major reason for altering the long range plans is that no structural changes will be permitted in the Sandford Fleming Building because of fire and building code regulations now in effect. The placement of the second 165-II in the Sandford Fleming Building would have required the removal of several corridor walls and structural changes in the basement to accomodate another motor generator unit to power the second 165-II.

The revised plans are to replace the 155-II at Huron Street with a 158 which will meet the Administration requirements for the next year to two years. This will provide the University with time to decide on the future of the Sandford Fleming Building and to plan for space which will be properly equipped to house computer equipment. The 158 is scheduled for installation on the July 1st weekend. The second 165-II will not be acquired at this time.

cont'd...

A CHANGE IN PLANS cont'd

The evaluation of the time-sharing machine for academic use is still ongoing and has not been greatly disrupted other than by time lost because of the fire. Accommodation of the time-sharing machine in the Sandford Fleming Building will be possible by moving the Sandford Fleming Terminal to the Engineering Annex in the space adjacent to the new Engineering Undergraduate Terminal area. The installation of the time-sharing machine will not require any structural modifications to the Sandford Fleming Building.

Consolidation of computing services in the original plan was predicated on the operation of all the machines under a common MVS Operating System. We intend to proceed with this aspect of the plan for both the new 158 and the existing 165-II. MVS will be installed on the 165-II provided its performance will be comparable to the current MVT operating system. The move to common operating systems will prepare us for the eventual consolidation of computing services in new quarters.

The APL and ATS services on the S/360-65 will continue to be offered during this interim period. Some upgrading of these services may be possible; however, the introduction of a new time-sharing machine may make this unnecessary.

If you have any comments, concerns or questions relating to changes in the Computer Centre's plans please give me a call (978-5058) or drop me a line.

Rein Mikkor

THE FIRE - THE EARLY HOURS

First reports of the fire in the Sandford Fleming Building were made at 2:15 a.m. February 11, 1977. Shortly thereafter, fire fighting units were on the scene as were many UTCC staff members. While firemen fought the blaze on the east side of the building, staff members were hastily removing magnetic storage to a nearby building. At no time was it certain how long staff would be allowed to continue the evacuation of storage and for this reason the order of removal was highly selective. The first items to go were system packs and online storage. Following disk packs were the magnetic tapes which were read-only status, then system and storage back-up tapes, followed by read-write status tapes, and finally work tapes. The tape move was facilitated by the quick thinking of Acting Director Rein Mikkor who stripped the hooks from a number of coat racks and loaded tapes on "donut style". Within three and a half hours the entire library of 135 disks and 5000 tapes had been removed with only 1 pack and 2 tapes being lost.

Although flames never reached the machine area, the final part of the move was carried out through light smoke and plenty of water. In fact, the stairs leading to the building could have passed for a small white water canoe run.

Once storage was removed, firemen and staff went to work covering machinery with tarpaulins, securing the area against possible water damage. With this task completed, staff were evacuated from the building.

cont'd...

THE FIRE cont'd

By 9 A.M. the fire was well under control and had been confined to the non-machine areas of the building. However, water and smoke damages to UTCC offices appeared to be extensive.

UTCC staff, displaced by the fire, congregated at 49 St. George Street. Staff from the house gave up their phone lines and offices so that the many incoming calls from reporters and alarmed users could be dealt with. There, in the midst of overcrowding and confusion, the initial plans for recovery were formulated.

Don Gibson

LSSC

UTCC's interim service site was located at IBM's LSSC (Large Systems Support Centre) in the IBM Valleybrook Computing Centre in Don Mills. This data centre has a S/370-168-3 MP (with 8 megabytes of memory on each half of the MP) and many of the latest devices, including a 3850 Mass Storage Subsystem, 3350 Storage Devices and a 3800 printer subsystem. Some valuable floor area was vacant and was used to install the IBM 3330-I disk drives and 3705 telecommunications processors needed to support UTCC online storage and teleprocessing.

The major projects which were undertaken on the weekend following the fire were as follows:

- to install MVT under VM on one half of the 168 MP.
- to convert all USER datasets which previously had resided on 2314's to 3330-I disks, including the move of the USER catalog.
- to generate a TP system which would support the 7 remote sites to be used during the week following the fire.
- to establish the operational aspects of running from that site, including the move of UTCC's entire 165 tape library to Valleybrook Drive.

By late Sunday, February 13, our MVT system was running under VM, most user datasets had been moved and TP had been established and tested to three remote sites. Monday morning saw the commencement of our service with three remotes operational on a dial-up service.

cont'd...

LSSC cont´d

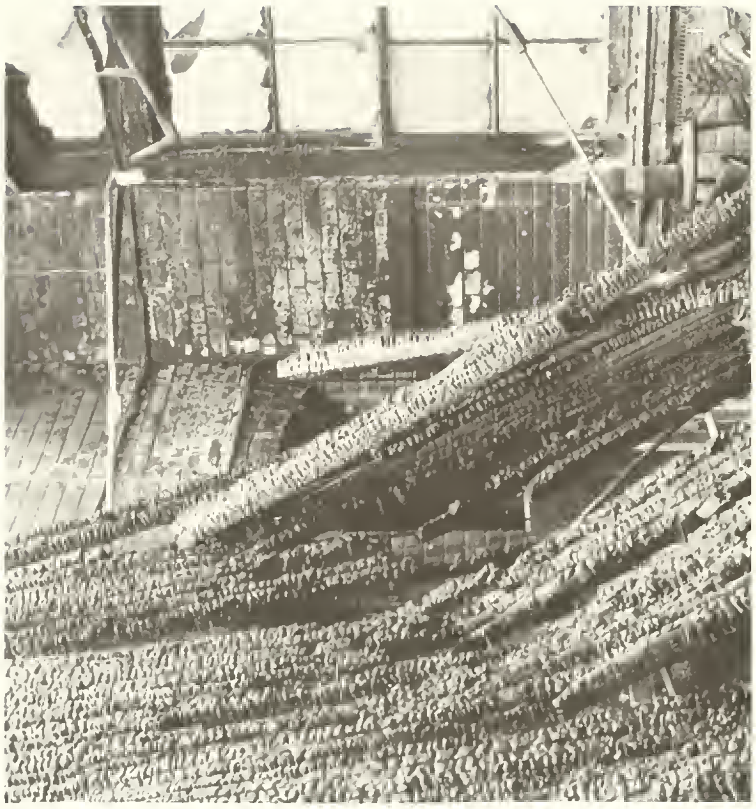
Throughout the day, the problems associated with the remaining remotes were solved one by one and full batch service was available by the end of the day.

The balance of the week was spent in alternating periods of intense activity (dealing with rush software problems) and quiet periods during which CMS, SPF, STARTREK and the other software goodies at LSSC became the objects of our attention. There were many new pieces of hardware to be investigated, and we managed to peak behind just about every panel on every unit on the floor. IBM was most gracious in allowing us the opportunity to see and try hardware and software systems unavailable at UTCC.

By Thursday, the dial-up lines were replaced by dedicated lines which operated at twice the speed of the dial-ups. Thursday´s production statistics were quite impressive and approached about one third of a normal 24 hour weekday load. After some initial hardware problems on Friday, service was brisk until the final shutdown before we packed up to move our system home late on Friday evening.

In summary, it was a very exciting and busy week and we all gained valuable experience working with the different equipment and operating systems. On behalf of UTCC, I would like to voice a special thanks to our hosts at LSSC. Without their solid support and cooperation, we would not have been able to make it happen as quickly and as successfully as we did. Thanks are also due to the UTCC staff who spent so many wearying hours installing and maintaining the software and running the system during the week.

Derry Cox



FIRE-RELATED EVENTS AT AST AND ASUT

On Monday, February 14, following the fire at the Sandford Fleming Building, most S/370 services were made available as a result of UTCC´s decision to rent time on an IBM S/370-168. The Arts and Science Terminal (AST) and the Arts and Science Undergraduate Terminal (ASUT) took on the load of the Sandford Fleming Terminal (SFT) and the Engineering Undergraduate terminal (EUT) which were unusable due to the fire. Two IBM 3780 work stations were installed in ASUT since the regular 2501 reader and 1403 printer are hardwired to UTCC´s S/370-165-II, and therefore, could not be utilized. The 3780´s plus the REMCOM in AST were initially connected to the 168 by dial-up ports and were hardwired later in the week.

cont´d...

FIRE-RELATED cont'd

During the week following the fire, several UTCC staff members were stationed at AST. The Information Office staff, tape librarian, SFT operators, SFT advisors and assorted other individuals set up working quarters at the terminal where they assisted users with the new system, helped with the operation of the terminal and answered the numerous queries about post-fire conditions. AST was allocated two extra rooms in Sidney Smith to cope with the extra staff and additional phones were installed. Because terminal conditions were crowded and in ASUT the work stations were slow (with 300 lpm printers and 150 cpm readers with no interleaving) self-service was discontinued and the terminals were run by operators. On Friday, high speed service on our S/370-165-II was restored in ASUT, and the terminal went back to self-service.

During this week a courier service ran between the 168 and AST three times daily, transporting tapes and output. UTCC bulletins on the status of services were sent out regularly via ATS and posted in all terminals.

On Saturday, February 19, all services were restored on UTCC's S/370-165-II. During the following week the reader and printer from EUT were moved to ASUT, so that there were two high speed readers and printers. Because ASUT had to cope with EUT users as well as the regular users, extra keypunches were brought in and set up near the terminal. EUT has since been relocated to the ground floor of the Engineering Annex.

cont'd...

FIRE-RELATED cont'd

The major problem encountered with the extra load was a keypunch shortage, plus the fact that, in contrast to EUT's normal hours, ASUT closes at 10:00 P.M. and does not open until 8:00 A.M. This has made conditions fairly crowded for high speed users.

During the week of the 21st, most of the extra staff who had been at AST were relocated in other areas. The SFT advisors remained to assist in advising for an additional week.

Looking back on the post-fire period, the AST and ASUT terminals ran fairly smoothly. Users were understanding when difficulties arose, and the quick recovery to our own system minimized serious problems.

Jill Reece

EUT/SFT: AFTER THE FIRE

Shortly after the fire, UTCC temporarily relocated the computer equipment from the damaged section of the Sandford Fleming Building. The card reader, line printer, control unit and some of the keypunches from EUT were moved to the Sidney Smith Building where they shared the quarters normally occupied by the Arts and Science Undergraduate Terminal (ASUT). The EUT keypunches were installed in the study room (SS1075) next to ASUT and the rest of the equipment was moved into ASUT (SS1073). Unfortunately, although this configuration allowed HSJS users to submit and retrieve jobs from two readers and two printers, lack of space at ASUT prevented the installation of all EUT keypunches and users had to make do with the crowded conditions.

At the same time, the Sandford Fleming Terminal equipment which escaped major damage was reconfigured. The interpreter, several keypunches and three TSO-hardwired 2741 terminals (from room SF120 and SF120B) were moved into the I/O room, SF112. The remaining APL and ATS terminals were relocated on the third floor of the McLennan Physical Laboratories. These moves made it possible for service to be restored quickly and provided UTCC with time to plan and implement more permanent changes.

EUT has now been moved to a more permanent location on the ground floor of the Engineering Annex Building. For details refer to the article NEW LOCATION FOR EUT appearing below.

Mark Tapia

UTCC ACCOUNTING DURING FIRE RECOVERY PERIOD

During the period February 14, 1977 to February 18, 1977, UTCC provided General Purpose Job Stream and High Speed Job Stream services from IBM's Large Systems Support Centre (LSSC). All jobs run during that period have been accounted for as usual. However, users should note the following points:

- Due to the different hardware and software environment, jobs executed at LSSC recorded approximately 1 to 4% lower usage for both CPU and memory resources than would have been utilized if these jobs had been run on UTCC's S/370-165-II.
- IBM was unable to provide any TSO service at LSSC. Accounting records for any TSO sessions between February 11 and February 18 have been discarded.

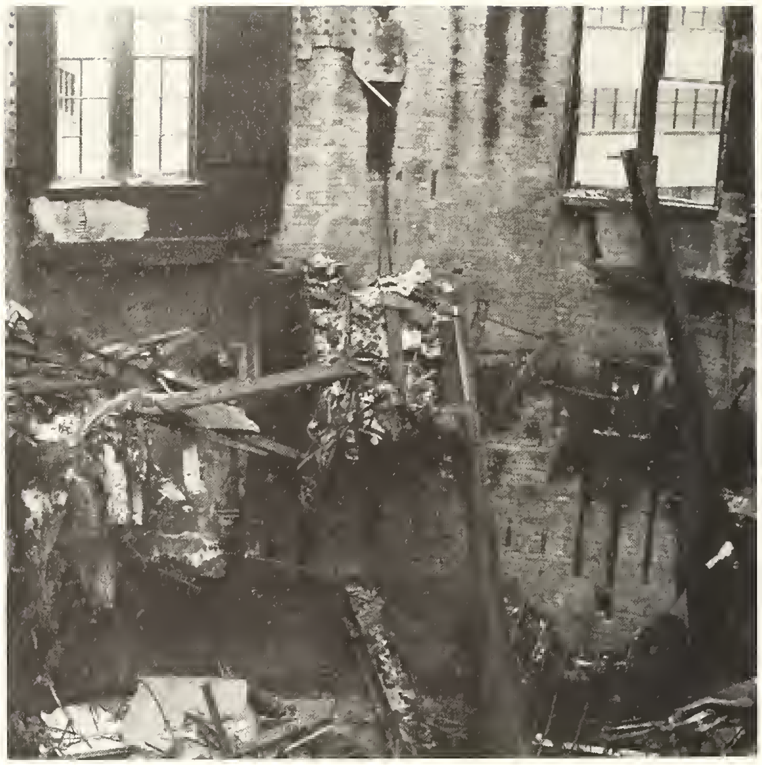
cont'd...

UTCC ACCOUNTING cont´d

- HSJS jobs run during the fire recovery period were accounted for in the usual manner.

The UTCC Accounting Office has been relocated in the Engineering Annex, Room 206. Due to the restricted number of phone lines into the Annex, the Accounting Office has been temporarily reduced to one phone. Until further notice, users should direct any inquiries concerning Accounts and Access Codes to 978-8703.

Henri Schuler



NEW LOCATION FOR EUT

The old Engineering Undergraduate Terminal (EUT), formerly located in the Sandford Fleming Building has been relocated on the ground floor of the Engineering Annex Building on Press Road. EUT is now located in space formerly occupied by the west half of the Engineering Cafeteria.

Although EUT is used primarily for running HSJS jobs, it will contain 20 terminals which can be used to access TSO, SHARP APL, APL/SV and ATS, additional keypunches for General Purpose Job Stream users and a user work area. The Advising Office is located on the second floor of the Annex in room 207.

Mark Tapia

ONLINE DATASET CHANGES

During the fire recovery period, UTCC provided General Purpose Job Stream services from IBM's Large Systems Support Centre (LSSC). Due to the lack of 2314 facilities at this backup site, all datasets on online 2314's were moved to 3330s and a new user 3330, USER12, was added to handle the load. These datasets were left on the 3330s when we moved back to our own S/370-165-II. A few datasets could not be copied due to I/O errors etc. and lists of these datasets are available from the Computing Co-ordinators. Also as a result of the move, many datasets will not be optimally blocked. UTCC will provide a re-blocking service for these datasets.

Please note that UTCC will no longer be providing on-line 2314 service. Therefore, users will no longer be able to code UNIT=2314 on an EXEC ALLOC statement. Users who must retain 2314 datasets will still be able to mount their own 2314s.

Users with any problems concerning these datasets should contact a Computing Co-ordinator who will arrange recovery and/or reblocking.

Michael Wagner

HOURS OF SERVICE - EASTER WEEKEND

The following hours of service will be in effect during the Easter weekend:

	APRIL 8 (FRIDAY)	APRIL 9 (SATURDAY)	APRIL 10 (SUNDAY)
S/370-165-II	CLOSED	10AM-6PM	10AM-6PM
S/360-65	UNATTENDED	UNATTENDED	UNATTENDED

Normal hours of service will resume on Monday, April 11, 1977.

SHARE 48

SHARE 48 was held the week of March 6, in Houston and was attended by approximately 3,500 people. More than 400 sessions were held covering every aspect of SHARE activity. The following is a summary of one of the sessions. For those interested, a number of sessions have been summarized and will be available in the Information Office, Room 206, Engineering Annex.

A session entitled 'The Myth of Human-Computer Communication' was given by Professor J. Posdamer. Professor Posdamer made it clear at the beginning of the session that the users he spoke of were non-computer types, such as architects, psychologists, etc. He was interested in knowing "Why are good systems not accepted by users?"

In Posdamer's opinion, 'human-computer communication' is a misnomer. What actually is taking place is interpersonal communication over a channel. In other words, the implementor of a system communicates with the user of that system by means of the hardware, software and documentation.

cont'd...

SHARE 48 cont'd

Posdamer maintained that for a system to be acceptable to a user, there should be consistency in communication in the following areas:

Format/Style - all error messages must appear in one location while prompt messages must appear always in another location, etc.

Vocabulary - a variable should have the same meaning in all sections of the system.

Speed (response time) - consistency in response time is more important than speed of response.

Medium of communication - if a system is designed to run on a hardcopy terminal it should not be run on a screen type terminal.

Posdamer also noted that all communcication should be done in one language and that the user must be able to understand and speak that language. For example, many systems mix languages in the reporting of error messages. Posdamer insisted that all error messages should be in the language spoken by the user.

In summary, Professor Posdamer maintained that the way to properly design a system is by thinking of how you would communicate with another person across the table. This will help to establish proper communication channels.

Ralph Lombardi

The following article is reprinted from the University of Toronto Bulletin (No. 22 30 Year February 4, 1977).

INSTITUTIONS MAY SHARE REGIONAL COMPUTER CENTRE

The maintenance of adequate computing facilities to serve both the academic and administrative needs of this University has become a serious problem, particularly in view of the present financial constraints and changing technology. A solution may lie in a regional computing centre. For this reason, a task force has been formed for the purpose of studying the feasibility of establishing such a centre. Members of the task force are: Dr. K. Okashimo, University of Guelph, Chairman; Dr. H.W. Smith, U of T; R. Mikkor, U of T; N. Foster, York University; W.W. Ralston, Ryerson Polytechnical Institute; and B.R. Miller, York-Ryerson Computing Centre.

cont'd...

INSTITUTIONS cont'd

The task force will be assisted in its studies by DMR and Associates, who will act as consultants. Their principals, who will be involved in the study, are Alain Roy of Montreal and Jim Kranias of Toronto. The main consideration of the task force will be to ascertain whether or not a regional computing facility will be sufficiently responsive to the particular needs of its three principals: U of T, York University and Ryerson. The accessibility of the centre, the quality of its work and its ability to cope with the variety of demands which may come its way will be difficult to assess, but nevertheless this aspect of the study is all important. In addition, the terms of reference of the task force include financial and economic considerations, the location of the central facility, its staffing and its organizational structure.

The task force will initiate and undertake its responsibilities as quickly as possible. It asks the co-operation of all concerned in providing assistance necessary to assemble data. The target date for the completion of the report of the task force is May 31, 1977. No action will be taken on this report until there has been adequate time for study and response. Committees dealing with policy, control(and operations of computer facilities will be consulted, as will individuals.

A.G. Rankin,
Vice-President, Business Affairs

ACCOUNTING CORRECTION

The following letter was sent to UTCC account holders in early February, 1977. Note that the address of the Accounting Office has been revised to reflect the currect location.

February 7, 1977

Dear Customer:

Due to an error in S/370 accounting programs, users were billed at the wrong rates during the period January 1 to February 3, 1977. The Total Job Charge shown on the trailer page was correct, but the nightly accounting routines incorrectly used an old rate schedule to determine the amount of money to be charged to the Service Access Code (SAC) and to the associated Customer Account Number (CAN). The charges were retroactively corrected in time for the January mailing, so users will see the correct amounts on their Activity Reports. The only services affected were General Purpose Job Stream (GPJS) and CALCOMP plotting.

The adjustment went into effect at 00:00 hours on Monday, February 7. Since the old (incorrect) rate schedule used lower rates, users should be aware of a possible sudden drop in the balance on their SACs and CANs. Any user interested in knowing the increased charge can contact the Accounting Office in Engineering Annex room 206 or at 978-8703.

Yours truly

B. McNeil,
Administration Manager

NEW UTCC OFFICE AND SERVICES LOCATIONS

As a result of the recent fire many UTCC offices and service areas have been relocated. Although most areas are now open for business, there is still an acute shortage of telephones and many staff members are temporarily sharing phone lines. The new locations and current phone numbers are listed below. Additional phone numbers will be published when they become available.

Services/Personnel	Location	Telephone #
Rein Mikkor UTCC Acting Director	McLennan Labs Room 351	978-5058
Secretary to Acting Director	McLennan Labs Room 351	978-6471
NEUT (NEW EUT) Keypunches and Work area	Engineering Annex Main Floor	N/A*
Mark Tapia NEUT Computing Co-ordinator	Eng. Annex Second Floor 207	978-8599
Public Terminals (future)	Eng. Annex Main Floor	N/A
UTCC Advising Office	Eng. Annex Second Floor 207	978-8599
UTCC Information Office & Technical Reference Centre	Eng. Annex Second Floor 206	978-4990
UTCC Accounting Office	Eng. Annex Second Floor 206	978-8703
UTCC Publications Office	Eng. Annex Second Floor 206	978-4990
Derry Cox Manager Operations	Eng. Annex Second Floor 206	978-7092
Eugene Siciunas Supervisor Hardware	Eng. Annex Second Floor 206	978-7092
Bert McNeil Manager Administration	McLennan Labs Room 354	978-8948

*Not available

GENERAL PURPOSE TIME SHARING SURVEY

UTCC users will be interested to learn the preliminary results of the General Purpose Time Sharing Survey mailed to you January 21, 1977. We thank all those who replied and note with special interest several letters which were sent in.

Response volume was not as high as we would have liked; 145 out of 3500 or less than 5%. Some forms are still trickling in. If you have one in your desk drawer, please complete it and mail it now!! Remember, the general purpose system implemented is intended to reflect your needs as communicated to UTCC. We will accept further responses until April 15th, 1977.

Indicated frequency of usage of present UTCC products by respondents was: GPJS 29%, HSJS 26%, APL 15%, ATS 15%, TSO 14%, and Information Systems 1%.

Products requested on a proposed GPTS system were distributed as: Text Editing 19%, FORTRAN 18%, RJE to Batch 16%, APL 14%, PL/1 11%, Statistical Packages 10%, Math Library 6%, and Other (eg. Assembler, Plotting, ALGOL, CSP) 6%. We noted that since BASIC was not on our suggested list, very few responses mentioned it.

Estimated connect hours totaled 52,000 for a one year period. To those still responding, you can use an average of $5/hr and estimate your total connect time in the form hours per week, then multiply by predicted number of working weeks for the year. This question seemed to give the most difficulty. An educated guess is all we require.

We are listening too, to your general comments. They seemed to revolve mainly around simplicity, ease of use, fast responses, better file systems and security, ease in learning and minimization or elimination of JCL.

Thank you for your time. This will help us to serve you better.

Bert McNeil

IMSL EDITION 4 LIBRARY TO BE REPLACED

The IMSL Library is an extensive collection of mathematical and statistical routines. Some areas covered are differential equations, interpolation, linear algebra, special functions, non-parametric statistics and regression analysis. Many of the functions of the old IBM Scientific Subroutine Package (SSP) are available in a more modern, up-to-date version in this library.

Edition 4 of the IMSL library is currently available at UTCC and the load modules are contained in the datasets APPL.IMSLSLIB and APPL.IMSLDLIB. An updated version (Edition 5) has been received and after April 30, 1977 only this version will be available. Over fifty new routines have been added and several other routines have been re-written.

In order to free much needed disk space, the load module libraries for IMSL Edition 5 are going to be constructed from scratch. On April 30, the current contents of the datasets APPL.IMSLSLIB and APPL.IMSLDLIB will be deleted and only Edition 5 routines which have been specifically requested will be put into these datasets.

cont'd...

IMSL EDITION 4 cont'd

All persons presently using IMSL routines are asked to contact Bob Chambers at 8823 or John Roth at 6878 to ensure that the new versions of the desired routines are placed in the above datasets on April 30. Requests after April 30 for other routines will also be handled by Bob Chambers or John Roth.

Any enquiries may be directed to Bob Chambers at 978-8823 or John Roth at 978-6878.

John Roth & Bob Chambers

APPL.STATLIB

Effective April 30, 1977, APPL.STATLIB will no longer be available on the S/370-165-II. This library currently contains everything but the kitchen sink, and we are not even sure about that. The BMD and BMDP libraries have been copied and IMSL routines are to be replaced. (See other articles in this issue of COMPUTERNEWS). The IBM Scientific Subroutine Package statistical routines have duplicates in APPL.SSPFLIB. That leaves only a handful of non-supported user-donated programs, which have been copied into APPL.STAT.STATLIB. In conjuction with this, source and document libraries are also being broken up and renamed. SSP source is already in USER.SSPFCOD and source and documents for the donated programs have been moved to APPL.STAT.STAT.SOURCE and APPL.STAT.STAT.DOC respectively.

These changes will be reflected in new USERBOOK documentation which will be issued shortly. This is part of a continuing effort to free disk space by eliminating duplication and to give datasets easily remembered names. Any user encountering difficulties or having questions should contact John Roth at 978-6878.

John Roth

ATTENTION BMD/BMDP USERS

A new release of the BioMeDical Computer Programs - P Series has recently been installed on our system. This release fixes many bugs and includes four new routines and the complete rewrite of another. The new programs are for Two-way Contingency Tables, Multiway Contingency Tables, Description and Estimation of Missing Data and All Possible Subsets Regression. The rewritten program is BMDP1F, for Two-way Contingency Tables. Supplements to the green manual describing these five routines have been ordered. One set is available from John Roth at 978-6878.

A new procedure, BMDP, has also been installed, replacing STATP. (See the article in this issue of COMPUTERNEWS on APPL.STATLIB.) The procedure STATPOPN has also been replaced by BMDPOPEN and changes have been made so that the control cards for LKED.SYSIN described in USERBOOK 3.7BMDP are no longer required. The procedure BIMEDT described in the BMDP manual is still not operational here however, and the complete FORTRAN subroutine must be coded for the open-ended programs.

cont'd...

BMD/BMDP cont´d

Thus, to access a non-open-ended program use:

```
// EXEC BMDP,PROG=BMDxxx
//SYSIN DD *
    .
    .
    BMDP control statements and data
    .
    .
/*
```

where BMDxxx is the program name.

For the open-ended programs use:

```
// EXEC BMDPOPEN,PROG=BMDxxx
//FORT.SYSIN DD *
    .
    .
    complete FORTRAN subprograms
    .
    .
/*
//GO.SYSIN DD *
    .
    .
    BMDP control statments and data
    .
    .
/*
```

The BMD routines have also been moved from APPL.STATLIB and new procedures called BMD and BMDOPEN have been installed. These are used in exactly the same way as the corresponding BMDP procedures described above. The only exception is for the program BMD14S, the Generalized Sorting Routine, which has its own procedure called BMD14S.

A new USERBOOK module combining the old 3.7BMD and 3.7BMDP modules is planned for the near future. Anyone having difficulties or questions should contact John Roth at 978-6878.

John Roth

WYLBUR WORDS

As a result of the fire which hit UTCC in February, WYLBUR implementation has been delayed again. UTCC is currently planning to install WYLBUR on the S/370-165-II in April, 1977.

Documentation will consist of a short USERBOOK module and a more detailed reference manual, both of which are in the final stages of preparation.

Charges for WYLBUR will initially be S/370 standard rates. i.e. users will be billed for connect time and CPU usage. The connect time will be $3.50 (the same as APL and TSO); the CPU time will be billed at a rate of $10.60 per minute (the same as Batch and TSO).

The telephone lines used to access WYLBUR may present some difficulty. Initially there will be two lines for EBCDIC terminals and eight for ASCII terminals. The phone number for 2741 terminals will be (978)-7235. For ASCII terminals the hunting group will consist of eight lines, the last four of which will be available only to non-centrex numbers. Thus, from a 978 number on the St. George campus, call 3950. From any other number, call 978-3954. More lines will be made available at a later date.

The exact installation date will be announced in HOTNEWS and in TSO sign-on messages.

Ian Darwin

SPEAKEZ SESSIONS

MU is New

As announced in previous issues of COMPUTERNEWS, the MU level of SPEAKEZ recently became the default for both Batch and TSO. The TSO prompter provides considerably faster startup time.

Reference Manual

The SPEAKEASY-3 Reference Manual for MU will not be available for a few months. Until then, users should use the old Reference Manual (printed via SPEAKMN), and the booklet "Highlights of the MU Level of SPEAKEASY". Copies of the booklet can be obtained from Ian Darwin at the address given below.

New in MU

The major highlights of MU include enhanced output control; a new version of the TEKTRONICS package, adaptability to other graphics terminals; new version of SETSPSS; facilities for SET logic; new error control options, a built-in SUGGEST/COMPLAIN/PRAISE function and several new optimization features. These will be described in the new MU Reference Manual. Users interested in these facilities or having problems, or suggestions should contact Ian Darwin at 978-7318 49 St. George, room 303.

Ian Darwin

APLFULL PRINT TRAIN ARRIVES

The APLFULL print train has arrived and is now available on the S/360-65 high-speed line printer.

This print train can be accessed through normal UTCC route print and forms code processing procedures. Special support facilities are available for the high-speed line printing of APL workspace listings from APLSV and SHARP APL.

Two buffer loads are supported with the APLFULL print train. The forms codes are:

7000 Series	7cff	for APLFULL
8000 Series	8cff	for APL/ATS

The APLFULL train contains both upper and lower case ROMAN graphics and most of the special graphics of the TN-STND train. Selecting the 8000 series buffer load will enable text containing TN-STND graphics to print normally.

APL graphics can be generated and embedded in the text by ATS overstrike processing. The assignment of APL graphics in the 8000 series buffer load has been made in such a way so as not to conflict with TN-STND usage.

A USERBOOK update to 3.8PRINTRAINS will list the detailed assignment of hexadecimal addresses to the graphics available from the two buffer loads. Charts printed on the APLFULL print train which give the hexadecimal addresses of the two buffer loads are available from the UTCC Information Office, Room 206 in the Engineering Annex. (See also the Supplement in this issue of COMPUTERNEWS).

For further details, refer to the HOTNEWS article in the SHARP APL workspace 1 HOTNEWS, or call DATATALK, 978-6710.

Ernst Goetze

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RSMAX REVISITED - PRECISION FOR LINEAR PROGRAMMERS

Some months ago, DATATALK developed the APL program RSMAX in order to correct two serious errors in the program RSIM (see COMPUTERNEWS, September 1976).

Since that time, RSMAX has aroused a lot of interest at UTCC and at other installations. In this issue of COMPUTERNEWS we would like to review the following situations where RSMAX *appears* to fail or where there has been some difficulty in reproducing our examples at other installations.

In theory, RSMAX solves the linear programming problem with *probability one* as follows. In the process of choosing which non-basic variable is to enter the basis at each iteration of the simplex algorithm and which basic variable is to leave, RSMAX attempts to resolve any *ties* in such a way as to cause a positive increase in the value of the objective function.

However, several examples can be given of cases in which RSMAX can make no such choice *for any* combination of which basic variable is to leave and which new basic variable is to enter the current basis. The following is an example which has failed at other installations and which can be made to fail on our system.

```
  maximize: 4X1  +   X2  +  X3 = z
subject to: 2X1  +   X2  + 2X3   10 (1)
            4X1  +  2X2  +  X3   12 (2)
            6X1  +         2X3    8 (3)
                     X2           4 (4)
             X1                   1 (5)
```

The appropriate input to RSMAX for this problem (including slack variables) is shown below:

```
A::=  4  1  1  0  0  0  0  0   0
      2  1  2  1  0  0  0  0  10 (1)
      4  2  1  0  1  0  0  0  12 (2)
      6  0  2  0  0  1  0  0   8 (3)
      0  1  0  0  0  0 -1  0   4 (4)
      1  0  0  0  0  0  0 -1   1 (5)
```

This problem is ill-posed, in the sense that the constraints are redundant. However, on our system, RSMAX solves the problem correctly, the first time, as follows:

```
    RSMAX A

1   1
2   4
3   0
4   4
6   2
12  0
1   8
```

meaning that the variables X1, X2, X3, X4 and X6 are in the optimal basis with the values 1, 4, 0, 4, and 2, respectively, and that an artificial variable, X12, that was in the basis at the end of PHASE I of the revised simplex algorithmn, remained in the final basis but was successfully held to the value 0.

The value of the objective function in the optimal basis is 8 (read from the last row of the matrix returned by RSMAX).

However, although

```
    RSMAX Ax1E1   (scale A by 10)
```

and

```
    RSMAX Ax1E2   (scale A by 100)
```

continue to yield the correct solution,

```
    RSMAX Ax1E3   (scale A by 1000)
```

returns

```
NO FEASIBLE SOLUTION
```

at the end of PHASE I, deciding that there is no feasible solution to the problem. This obviously cannot be correct as scaling affects only the value of a solution and not the question of its existence or non-existence.

cont'd...

RSMAX REVISITED cont´d

Unfortunately, the theory of linear programming with the simplex method does not account for the finite precision of machine arithmetic that causes RSMAX to be unable to achieve a positive increase in the value of the objective function on a particular iteration and at the same time fail to conclude that the current basis is optimal.

There are, however, some protections against this case. RSMAX now posts a FLAG=1 beside the value of the objective function (last row) if, in at least one iteration of the simplex method during PHASE II, RSMAX was unable to achieve a positive increase in the value of the objective function and at the same time failed to conclude that the cubrent solution was optimal. If FLAG=1, the solution is suspect and should certainly be tested with post-optimal analysis techniques. FLAG=0, indicates that the solution given has been found by RSMAX to be optimal and was reached with a positive increase in the value of the objective function at each iteration of simplex method during PHASE II.

In suspect cases, we recommend that the user simply rotate the order in which the constraint equations are presented to RSMAX until it terminates with a feasible solution. We have found this to be successful in all cases where loss of arithmetic precision has not completely thwarted the intent of the simplex algorithm.

References:

1. RSMAX and associated programs, SIMPLEX and LPMAX, are extensively documented in the ECONOMETRICS Section, Section 10, of the SHARP APL LIBRARY CATALOG, and in the workspace documentation for the APL workspace, 70 LINPR.
2. Copies of the APL NOTE:PROBLEMS WITH RSIM (September, 1976) are available from DATATALK.
3. The notice, RSMAX REVISITED, in the SHARP APL HOTNEWS workspace, 1 HOTNEWS, summarizes the remarks made in this article.

Ernst Goetze

REORGANIZATION OF HSJS LIBRARIES

UTCC has scheduled a reorganization of all the High Speed Job Stream libraries for April 30, 1977. The reasons for this move are outlined below:

1. The libraries currently available to HSJS users occupy more than 750 tracks of space and contain the equivalent of over 100,000 card images.
2. There is very little free space available in the PL/C and WATFIV libraries. As a result, routines cannot be installed as quickly as we would like. Some users have to wait as long as a week before more space can be freed.
3. The libraries have become unmanageable. For example, the WATFIV library contains over 300 routines, many of which are riddled with errors or use obsolete or inefficient agorithms coded more than ten years ago.
4. Many routines are never used or are poorly documented.

The following library members will be retained:

1. The plot simulation package in WATFIV documented in USERBOOK 3.8SIMUL.

cont´d...

REORGANIZATION cont'd

2. EISPAK, the eigenvalue and eigenvector routines developed by Argonne National Laboratories and available in WATFIV.

3. The built-in functions in WATFIV.

4. Routines which the users formally request to be retained. Requests should be forwarded to the Computing Co-ordinator or to Mark Tapia at 978-8599.

5. Any routines added to any library after April 1, 1977.

After April 1, 1977, any member added to any library will remain in the library for a maximum period of one year, and must be submitted with a brief description of the purpose of the routine. This description will be placed in an index in machine-readable form and will be accessible to each HSJS user and at each terminal. Members which are deleted will be archived onto a tape but will no longer be accessible to HSJS users.

Mark Tapia

ADVISING HOURS

The Sandford Fleming Terminal Advising Office which was destroyed in the fire, has been relocated on the second floor of the Engineering Annex Building in Room 207. Summer advising hours will be in effect from Monday, April 11, 1977 until mid-September 1977 as follows:

Monday-Friday 10:00 - 17:00

Mark Tapia

ADVISOR JOB OPENINGS

There are openings for Programming Advisors at the Sandford Fleming and Arts and Science Terminals for the 1977-1978 academic year. Applicants should have a thorough knowledge of FORTRAN and PL/I and experience in at least one other programming language. Familiarity with OS/UTILITIES and JCL is also required. Applicants should be able to communicate effectively with both HSJS and GPJS users.

Applicants should contact Mark Tapia (978-8599) in the Engineering Annex, Room 207, for positions at SFT/EUT or Jill Reece (978-6509) in Sidney Smith, Room 2104, for positions at AST/ASUT.

Mark Tapia

FREE CARD SORTER

Anyone interested in acquiring a free IBM Card Sorter (presently not in working condition but waiting for the right person to bring it back to life) should contact Jill Reece at AST, Sidney Smith Building room 2104, or phone 978-6509. Transportation for the sorter is not provided.

Jill Reece

BOX STORAGE DISCONTINUED

UTCC's Box Storage facility has been suspended due to space limitations resulting from the fire. The space previously given to the storage cabinets is now being used for 2741 terminals and keypunches. The cabinets themselves are being used to house Information Office stock.

A third of the user card decks are still unclaimed. UTCC urges the owners of these decks to pick them up as soon as possible. The remaining decks will be cleared by the middle of April, 1977.

Don Gibson

EDUCATION SCHEDULE

The two short courses, "Introduction to JCL" and "Introduction to SPSS" advertised in the last issue of COMPUTERNEWS were not held as scheduled due to a rearrangement of work priorities which became necessary as a result of the recent fire.

As of this date, UTCC is not planning to hold any courses until after the resumption of the fall term (probably late October).

UTCC regrets any inconvenience to users resulting from the cancellation of the two recently planned courses. Any questions or suggestions regarding the UTCC Short Course program, should be directed to Marg Doherty, Information Office, Room 206, Engineering Annex, 978-4990.

Marg Doherty

PERSONNEL CHANGES

UTCC welcomes several people who have joined us during the last two months. They are Janet Latimer, Robert Parry, Sally Holton, Patty Graham and Sandra Yen.

Janet will be working in I/O, Sally and Sandra have joined Programming Services and Robert is the new computer operator at Scarborough College. Welcome all.

Leaving the Centre were George Milo, Lillian Robbins, Winston Davis, George Olshevsky and Maria Desfigies. Best of luck to all of you in your new pursuits.

Vidya Gopaul has transferred out of CRF and Gail Cavers formerly with the UTCC Information Office is now working with the Accounting Office.

June Bridges

GPJS - SOFTWARE USAGE STATISTICS

The following chart summarizes the software usage per classified procedure and program name for the General Purpose Job Stream from January 3, 1977 to February 11, 1977 and from February 19, 1977 to March 2, 1977.

SOFTWARE	USES (#JOBSTEPS)	(%)
ALGOL	48	0
APLSV	34	0
ASM	893	2
ATSUTIL	1	0
BMD/BMDP	692	2
COBOL	699	2
CSMP	120	0
DATATEXT	287	1
DBUGUTIL	36	0
DISKUTIL	3,177	7
DSUTIL	6,619	15
DYNAMO	7	0
FORMAC	1	0
FORTRAN	13,837	30
GPSS	269	1
GRAPHICS	3,382	7
JCLUTIL	274	1
LISP	12	0
MARKEXAM	43	0
MARKIV	1,433	3
MPS/MPSX	79	0
OSUTIL	428	1
PAPERTAP	75	0
PL/I	2,934	6
RPG	131	0
SAS	310	1
SERVAID	319	1
SNOBOL	1,422	3
SORTMERG	2,128	5
SPEAKEZ	36	0
SPSS	4,153	9
TAPEUTIL	562	1
TIPRS	189	0
TSO	78	0
WYLBUR	201	0
XFR	480	1
TOTAL	45,389	

Kin Fong

S/370-165-II RELIABILITY (JANUARY)

The reliability statistics for January 1977 indicate an uptime percentage of 99.2 while the average number of unscheduled IPL's per day reached .76. The number of scheduled hours of production for January totalled 479.

MONTHLY COMPARATIVE FIGURES

MONTH	% UPTIME	UNSCHED. IPLs/DAY
Jan/76	99.1	0.43
Feb/76	98.9	0.97
Mar/76	96.8	1.03
Apr/76	99.3	0.52
May/76	98.8	0.67
Jun/76	96.5	0.97
Jul/76	96.4	0.72
Aug/76	99.4	0.47
Sep/76	98.4	0.86
Oct/76	96.9	0.83
Nov/76	98.2	1.10
Dec/76	99.3	0.48
1976	98.2	0.75
Jan/77	99.2	0.76

The percentage breakdown for total system downtime for January was:

HARDWARE: 110 minutes (42.6%)
SOFTWARE: 109 minutes (42.3%)
OTHER : 39 minutes (15.1%)

The major events contributing to these downtime totals were as follows:

JAN 17 - 28 minutes down - 0 IPL's
All time attributed to being unable to restore the drum (2301) after a number of heads had been repaired in the unit by IBM.

JAN 19 - 54 minutes down - 2 IPL's
a. 32 minutes were required to recover from disastrous errors on the HASP spool volume. No jobs were lost.

cont'd...

S/370-165-II cont'd

b. 22 minutes charged to a HASP catastrophic error.

JAN 31 - 33 minutes down - 3 IPL's
All time resulted from three HASP catastrophic errors.

Paul Scarborough

S/370-165-II RELIABILITY (FEBRUARY)

The reliability statistics for February 1977 indicate an uptime percentage of 97.7 while the average number of unscheduled IPL's per day reached .60. The number of scheduled hours of production for February totalled 368.

MONTHLY COMPARATIVE FIGURES

MONTH	% UPTIME	UNSCHED. IPLs/DAY
Jan/76	99.1	0.43
Feb/76	98.9	0.97
Mar/76	96.8	1.03
Apr/76	99.3	0.52
May/76	98.8	0.67
Jun/76	96.5	0.97
Jul/76	96.4	0.72
Aug/76	99.4	0.47
Sep/76	98.4	0.86
Oct/76	96.9	0.83
Nov/76	98.2	1.10
Dec/76	99.3	0.48
1976	98.2	0.75
Jan/77	99.2	0.76
Feb/77	*97.7	0.60

* Based on special hours of service during fire recovery time

The percentage breakdown for total system downtime for February was:

HARDWARE: 355 minutes (70.4%)
SOFTWARE: 125 minutes (24.8%)
OTHER : 24 minutes (4.8%)

The major events contributing to these downtime totals were as follows:

FEB 4 - 125 minutes down - 4 IPL's

All time and reloads attributed to channel control checks on the ITEL controller attached to channel 3. A bad chip was replaced in the unit.

FEB 11-12-13

The University of Toronto Computer Centre closed down at 02:15 on February 11, due to the fire in the Sandford Fleming Building. Downtime as related to scheduled uptime amounted to 34 hours while we transferred our operations to IBM's Valleybrook Data Centre. Limited service was restored at 10:00 a.m. on February 14 and continued on a single shift basis (10:00-18:00) until February 18. Full service resumed on the S370/165-II at 10:00 a.m. on February 19, 1977.

FEB 27-28 - 28 minutes down - 1 IPL

All time charged to faulty zap applied for new 3330 addresses 4D0-4DF which resulted in data being over-written on USER06 VTOC - USER06 was restored from a two day old backup tape.

Paul Scarborough

```
                                   DOWNTIME_REPORT_ON___S/310__FOR_JAN_77


-----------------------------------------------------------------------------------------------------------------------------
|                                                  REIPLS(PREQ) // DOWNTIME (MN)                                            |
|  DAY  REIPL   DNTIME 0    5   10   15   20   25   30   35   40   45   50   55   60   65   70   75   80   35   30   95  100|
=======================+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+|
| S  1 (CENTER CLOSED) |                                                                                                    |
| S  2 (CENTER CLOSED) |                                                                                                    |
| M  3     0       0   |                                                                                                    |
| T  4     1      10   |□*********                                                                                          |
| W  5     2      15   |□□*************                                                                                     |
| T  6     2      13   |□□***********                                                                                       |
| F  7     2      17   |□□***************                                                                                   |
| S  8     0       0   |                                                                                                    |
| S  9     0      15   |***************                                                                                     |
| M 10     2      12   |□□**********                                                                                        |
| T 11     1       9   |□********                                                                                           |
| W 12     0       0   |                                                                                                    |
| T 13     0       0   |                                                                                                    |
| F 14     0       7   |*******                                                                                             |
| S 15     0       0   |                                                                                                    |
| S 16     0       0   |                                                                                                    |
| M 17     1      23   |□**********************                                                                             |
| T 18     0       0   |                                                                                                    |
| W 19     2      54   |□□****************************************************                                              |
| T 20     1       5   |□****                                                                                               |
| F 21     1       8   |□*******                                                                                            |
| S 22     0       0   |                                                                                                    |
| S 23     0       0   |                                                                                                    |
| M 24     0       5   |*****                                                                                               |
| T 25     1       8   |□*******                                                                                            |
| W 26     1       4   |□***                                                                                                |
| T 27     1       5   |□****                                                                                               |
| F 28     0       0   |                                                                                                    |
| S 29     0       0   |                                                                                                    |
| S 30     1      10   |□*********                                                                                          |
| M 31     3      20   |□□□*****************                                                                                |
-----------------------------------------------------------------------------------------------------------------------------


LEGEND        : ONE □  =ONE UNSCHED. IPL
                ONE *  =ONE MINUTE OF DOWNTIME

                TOTAL SCHEDULED HOURS OF PRODUCTION :  479
                TOTAL DOWNTIME (MN)   :   245 , AVG/DAY :    8.45 , AVG/PROD HOUR :    0.25
                TOTAL UNSCHED. IPL'S :.    22 , AVG/DAY  :    0.76
                DOWNTIME RATE IS      :   0.85 PERCENT OF SCHEDULED PRODUCTION HOURS
```

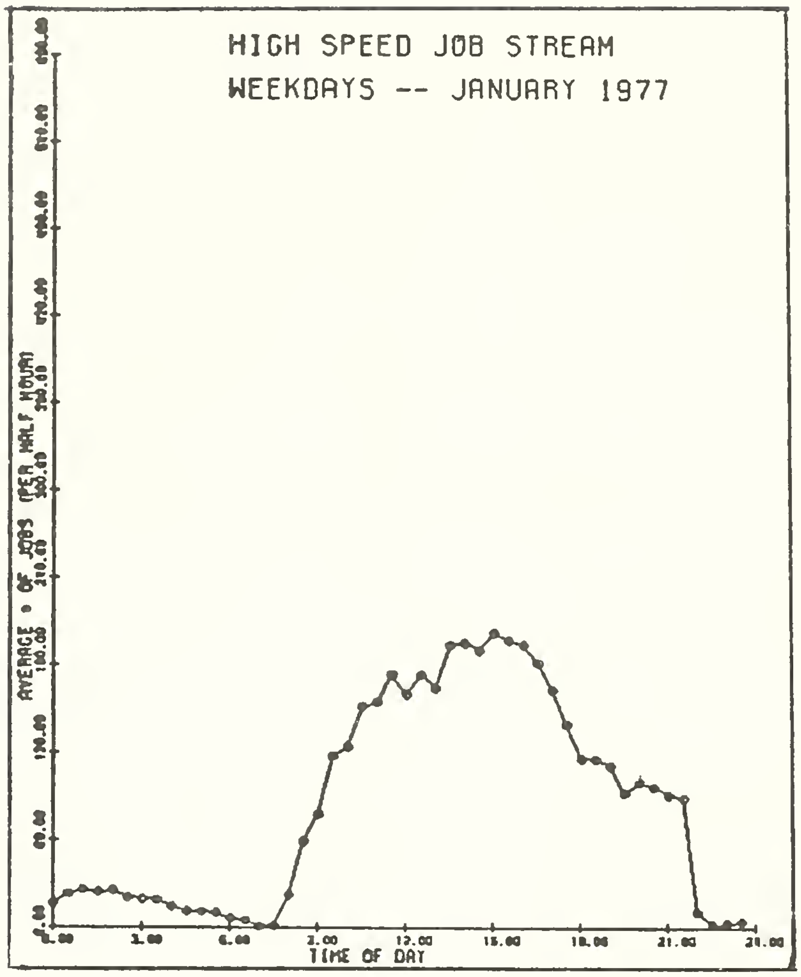
```
                 DOWNTIME_REPORT_ON___S/370__FOR_FEB_77


-------------------------------------------------------------------------------------------------------------------------------
|                                                    REIPLS(FREQ) // DOWNTIME (MN)                                            |
|  DAY  REIPL   DNTIME 0    5    10   15   20   25   30   35   40   45   50   55   60   65   70   75   80   85   90   95  100|
=====================+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+----+|
| T  1      0      10 |**********                                                                                          |
| W  2      1       7 |□******                                                                                             |
| T  3      0       6 |******                                                                                              |
| F  4      4     125 |□□□□************************************************************************************************ 125 |
| S  5      0       0 |                                                                                                    |
| S  6      0       0 |                                                                                                    |
| M  7      0       0 |                                                                                                    |
| T  8      0       0 |                                                                                                    |
| W  9      0       0 |                                                                                                    |
| T 10      1       7 |□******                                                                                             |
| F 11 (CENTER CLOSED) |                                                                                                    |
| S 12 (CENTER CLOSED) |                                                                                                    |
| S 13 (CENTER CLOSED) |                                                                                                    |
| M 14      1       8 |□*******                                                                                            |
| T 15      1      52 |□***************************************************                                                |
| W 16      2      30 |□□****************************                                                                      |
| T 17      0       0 |                                                                                                    |
| F 18      1     200 |□*************************************************************************************************** 200 |
| S 19      0       0 |                                                                                                    |
| S 20      0       0 |                                                                                                    |
| M 21      1       5 |□****                                                                                               |
| T 22      0       0 |                                                                                                    |
| W 23      1       5 |□****                                                                                               |
| T 24      0       0 |                                                                                                    |
| F 25      0       0 |                                                                                                    |
| S 26      1      15 |□**************                                                                                     |
| S 27      1      28 |□***************************                                                                        |
| M 28      0       0 |                                                                                                    |
-------------------------------------------------------------------------------------------------------------------------------


LEGEND      : ONE □  =ONE UNSCHED. IPL
              ONE *  =ONE MINUTE OF DOWNTIME


                TOTAL SCHEDULED HOURS OF PRODUCTION :  368
                TOTAL DOWNTIME (MN)   :  498 , AVG/DAY :  19.92 , AVG/PROD HOUR :   0.56
                TOTAL UNSCHED. IPL'S  :   15 , AVG/DAY  :   0.60
                DOWNTIME RATE IS      :  2.26 PERCENT OF SCHEDULED PRODUCTION HOURS
```

HSJS MONTHLY STATISTICS

During the month of January, 1977, 100,470 jobs were processed compared with 149,679 for the previous year a decrease of 32.9%. During the month of February, 1977 108,097 jobs were processed compared with 197,835 for the previous year, a decrease of 45.4%.

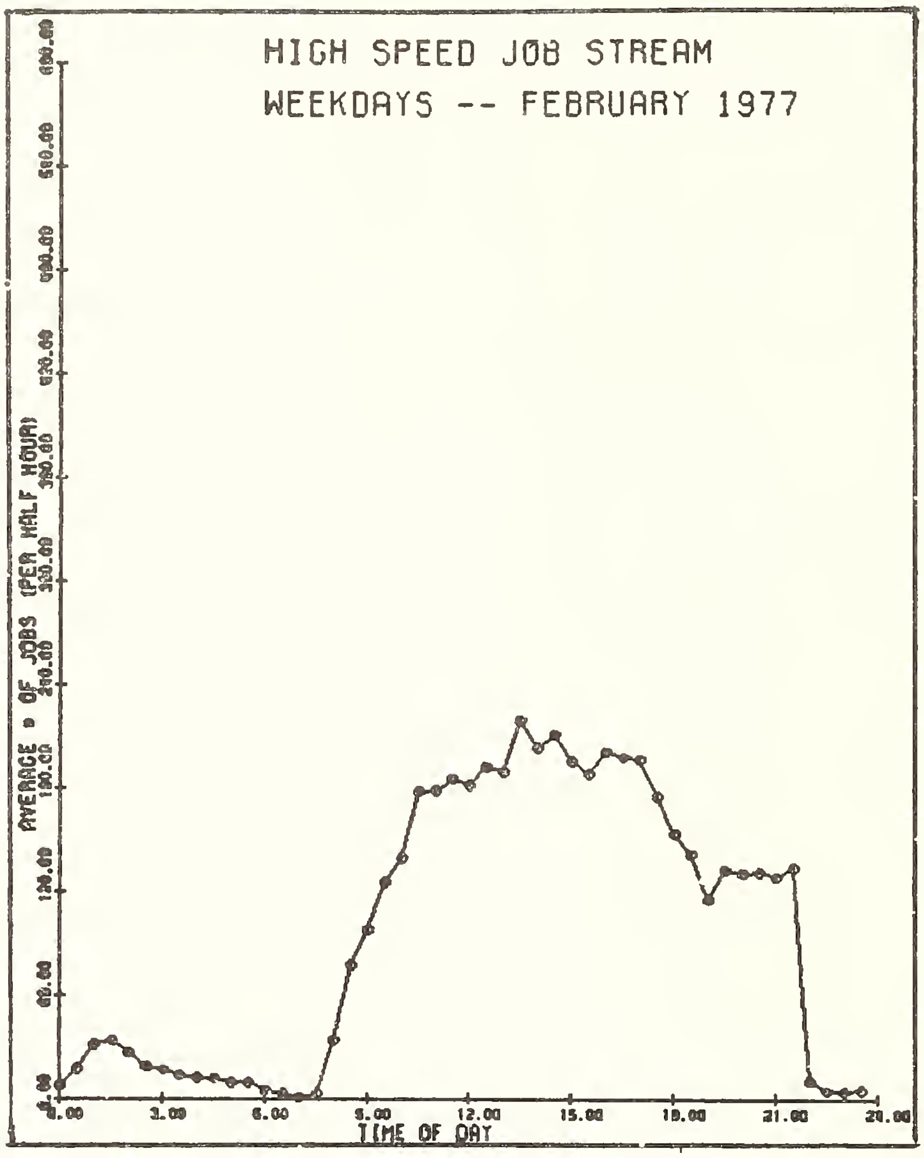
The following charts summarize the HSJS activity for the months of January and February. The graphs represent the average number of jobs processed during each half hour period of the day.

Mark Tapia



RESOURCE USAGE BY PROCESSOR

			TOTAL PER PROCESSOR			AVERAGE PER USE		
PROCESSOR	#USES	%TOTAL	CPU (MIN)	#CARDS READ	#LINES PRINTED	CPU (MIN)	#CARDS READ	#LINES PRINTED
WATFIV	40288	(40)	484.81	5677820	6605858	0.012	140	163
PL/C	33537	(33)	738.06	5627970	9736110	0.022	167	290
SP/K	9346	(9)	90.88	465189	1072583	0.010	49	114
UTILITY	3653	(3)	6.88	311732	611961	0.002	85	167
WATBOL	3641	(3)	38.38	701768	840708	0.010	192	230
ALGOLW	3633	(3)	16.63	356155	555212	0.005	98	152
SPSSQ	1932	(1)	34.69	248497	259363	0.018	128	134
ASMG	1713	(1)	22.88	203543	343052	0.013	118	200
SNAP	1419	(1)	14.50	45619	175524	0.010	32	123
$	593	(0)	16.31	56719	82363	0.027	95	138
SPITBOL	506	(0)	6.75	112634	144677	0.013	222	285
PLUTO	75	(0)	0.75	5037	15188	0.010	67	202
LISP	43	(0)	0.94	8091	8764	0.022	188	203
ASSIST	40	(0)	0.13	5988	7819	0.003	149	195
UTILITY	39	(0)	0.00	3124	3480	0.000	80	89
SIMON	11	(0)	0.00	256	449	0.000	23	40
SP/KM	1	(0)	0.00	2	12	0.000	2	12
UTILITY	0	(0)	0.00	0	0	0.000	0	0
TOTAL	100470		1473.00	13830144	20463123	0.015	137	203



RESOURCE USAGE BY PROCESSOR

PROCESSOR	#USES	%TOTAL	TOTAL PER PROCESSOR CPU (MIN)	#CARDS READ	#LINES PRINTED	AVERAGE PER USE CPU (MIN)	#CARDS READ	#LINES PRINTED
WATFIV	46855	(43)	454.44	4950036	7003833	0.010	105	149
PL/C	30157	(27)	628.44	5769837	9770150	0.021	191	323
SP/K	6021	(5)	50.69	371804	693465	0.008	61	115
ALGOLW	5033	(4)	39.19	1172577	1545253	0.008	232	307
ASMG	3765	(3)	43.75	381611	856136	0.012	101	227
UTILITY	3472	(3)	6.06	313135	507839	0.002	90	146
SPSSQ	3060	(2)	45.56	224368	454031	0.015	73	148
WATBOL	2428	(2)	41.13	719027	859249	0.017	296	353
SNAP	2239	(2)	31.00	73551	476960	0.014	32	213
LISP	2238	(2)	9.25	102428	280722	0.004	45	125
SPITBOL	1850	(1)	18.63	268122	427360	0.010	144	231
$	853	(0)	18.06	70961	139280	0.021	83	163
UTILITY	66	(0)	0.00	3145	3784	0.000	47	57
ASSIST	46	(0)	0.31	4439	8963	0.007	96	194
SIMON	8	(0)	0.00	231	355	0.000	28	44
PLUTO	6	(0)	0.00	1138	1133	0.000	189	188
SP/KM	0	(0)	0.00	0	0	0.000	0	0
UTILITY	0	(0)	0.00	0	0	0.000	0	0
TOTAL	108097		1386.88	14426410	23028513	0.013	133	213

INTERACTIVE SYSTEMS RELIABILITY (JANUARY)

The uptimes achieved for the month of January for both APL and ATS were 99.17% of scheduled operation. The scheduled hours of operation during this month totalled 480, while the number of unscheduled IPL´s per day was 0.10. In addition to the scheduled time, Interactive Services were also available for approximately 111 hours of unattended weekend operation.

The major event contributing to downtime was as follows:

JAN 24: 155 minutes of downtime were attributed to the upgrading of communications controller to 3705-II. Customer engineer encountered several hardware problems resulting in longer than anticipated maintenance time.

The following table summarizes the time lost out of scheduled hours of production due to system failures for each of the systems.

Kam Jain

DATE	DOWNTIME (MIN)		REASON
	APL	ATS	
Thu. Jan. 6	33	33	*IPL necessitated to recover HASP line (Hardware)
Fri. Jan. 7	8	8	*IPL necessitated to recover HASP line (Hardware)
Wed. Jan 19	7	7	*System entered wait state - low core overlay (Hardware)
Sun. Jan 23	155	155	3705 upgrading overlapped into production hours. (Hardware)
Wed. Jan 26	32	32	Control terminals locked - software error in emulator program. (Software)
TOTAL	235	235	*Re-IPL required

System failures January 1 to January 31, 1977

INTERACTIVE SYSTEMS RELIABILITY (FEBRUARY)

The uptimes achieved for the month of February for each of APL and ATS were 97.08% and 97.25% of scheduled operation, respectively. The number of scheduled hours of operation during the month of February totalled 449, while the number of unscheduled IPL´s per day was 0.5. In addition to the scheduled time, Interactive Services were also available for approximately 84 hours of unattended weekend operation.

The percentage breakdown of total system downtime for February was: Hardware - 624 minutes (94.4%), Other - 37 minutes (5.6%). Fourteen unscheduled IPL´s were required as a result of the system failures. The major events contributing to downtime were as follows:

Feb. 6 351 minutes of downtime were attributed to hardware problems in the multiplexor channel. Customer engineer swapped a bad card to another location which was subsequently replaced during preventive maintenance.

Feb. 7 58 minutes of downtime and 3 system reloads were attributed to a loose card in the 3705 communications controller locking all APL leased line terminals.

Feb. 24-27 - 192 minutes of downtime and 7 Re-IPL´s resulted due to system hanging intermittantly on channel 0 in the multiplexor channel. Customer engineer retimed the main channel and stopped various cards but the problem was still not resolved. Finally, after 17 hours of IBM corrective maintenance, a Technical Specialist isolated the problem in a bad cable in 2870 which was subsequently replaced.

The following table summarizes the time lost out of scheduled hours of production due to system failures for each of the systems.

Kam Jain

DATE	DOWNTIME (Mins)		REASON
	APL	ATS	
Fri. Feb. 4	52	30	*Bad volume label and no path available ITS018 (Hardware)
	14	14	*Incorrect 3705 load (operational)
Sun. Feb. 6	351	351	*Solid system state-multiplexor problem (Hardware)
Mon. Feb. 7	83	61	***APL leased line terminals locked out (Hardware)
Tue. Feb. 8	11	11	Late IPL - IBM preventive maintenance overlapped into production hours (Other)
Thurs. Feb. 10	16	16	*Machine check (Hardware)
Sat. Feb. 12	6	6	Line errors - Hasp/Hasp Communication line (Hardware)
Mont. Feb. 14	5	-	APL abended - Machine check (Hardware)
Mon. Feb. 21	6	6	ATS ROLLIN overlapped into Production hours (Other)
Thur. Feb. 24	61	61	**System hanging on Channel 0-multiplexor channel. (Hardware)
Fri. Feb. 25	60	62	*System hanging on channel 0-multiplexor channel (Hardware)
Sat. Feb. 26	15	15	*System hanging on channel 0-multiplexor channel (Hardware)
Sun. Feb. 27	106	107	***System hanging on channel 0-multiplexor channel (Hardware)
TOTAL	786	740	*IPL Required

System Failures Feburary 1 - February 28, 1977

GRAPHIC APPROACH TO THE DESIGN OF APL TRANSLATE TABLES

The inclusion of translate tables that assign a correspondence between *APL* character codes and System/360 internal character codes is a software feature of the *SHARP APL FILEPRINT* facility.

The concept, however, has a more general range of applicability. One example of its use is in the high-speed line printing of *APLSV* workspace listings on the *APLFULL* print train, available from the *APLSV* workspace, 4 *WSL*.

In this short article, we will sketch the basic problems and give an example of how we can solve them by using the translate table concept.

The *APL* character set is given by the *APL ATOMIC VECTOR*, ⎕*AV*, and has 256 elements, not all of which can be generated as keyboard input at your terminal.

Some *APL* graphics are generated by *APL* overstrike processing, as, for example, A̲ (*A*, backspace, underscore), or ⍉ (transpose-circle, backspace, backslash), and are treated by *APL* as a single *APL* character code.

CHART I shows the *APL ATOMIC VECTOR*, ⎕*AV*, and the corresponding hexadecimal address in ⎕*AV* of each of the *APL* character codes.

CHART II shows the character graphics of the *APLFULL* print train and the hexadecimal address assigned to each graphic in the *APLFULL* buffer load.

**Caution:graphics for left and right curly brackets, diamond and the radical sign are not shown since the appropriate slugs were not shipped with our train. That is being fixed and will result in changes to the characters now showing in positions *HEX*'*FA*', '*FB*', '*FC*', '*FD*' and '01' . Installation of the new characters will necessitate changes in the buffer load shown in *CHART II*, which should be regarded as included here only for purposes of illustration of the concepts involved.

One sees immediately that not all *APL* graphics are represented by print train graphics as a single character code, and, conversely, there are some print train graphics that do not appear in the *APL* character set.

For example, neither of the *APL* characters, A̲ and ⍉ , are represented on the train, and, on the other hand, special symbols such as #, @, % and the upper and lower case ROMAN graphics, are.

Secondly, line control characters in ⎕AV, such as line-feed, upper and lower case backspace and carriage return, are expected to generate the correct response on output destined for the high-speed line printer.

The only case in which that is true is in the case of *SHARP APL FILEPRINT* processing for print files created on *SHARP APL*.

In all other cases - *ATS*, *APLSV* and print output routed to the System/360 from the System/370 - standard machine control characters must be used in the first byte of every print line.

With these problems in mind, we can perhaps understand why translate tables are longer than one would expect they should be, namely 512 elements, rather than 256.

Formally, a translate table is a 128 element packed decimal integer representation of an assigned correspondence between *APL* character codes and host system character codes. The packing is 4 decimal integers in the range 0 to 255 to 1 decimal integer in the translate table. Hence, there are 512 elements in the generic, unpacked, representation of the translate table.

Packing and unpacking translate tables is not really a problem; the *APL* functions *PACK* and *UNPACK* in the workspace 3 *HSPRINT* on *SHARP APL* and *APLSV* can be used to do that.

Thus, we've found that the best way to think about translate tables is as a 2×256 element matrix, and, for reasons that we will go into in a moment, it is useful to carry this one step further and think of 16 2×16 element planes, and finally, as a 16×16 element matrix, each element of which is a 2×1 element matrix.

Hence, without further hesitation, the translate table that is used to map *APL* character codes to the correct print train graphics can be displayed at your terminal, as follows:

```
    )LOAD 3 HSPRINT
```

and type

```
    1 0 2 ⍉ 0 2 1 ⍉ 2 16 16⍴UNPACK APL
```

Please refer to:

CHART III Matrix representation of the *UNPACKED*
translate table associated with the *APLFULL*
BUFFER LOAD.

Now, consider how the *APL* character '*A̲*', which does not appear in the *APLFULL* print train graphic set, is generated.

*STEP*1: Locate '*A̲*' in ⎕*AV*

HEX'71' = 113 = ⎕*AV*⍳'*A̲*'

In the translate table, the position *HEX*'71' shows a 2×1 element matrix, 193 61.

The first row element, *HEX*'C1' = 193, directly indexes into the *APLFULL BUFFER LOAD* and causes the graphic *APL* '*A*' to be printed.

The second row element, *HEX*'3D' = 61, indexes back into ⎕*AV* again, addressing the *APL* character '_' (underscore).

Use this character, '_', to begin at *STEP*1 again.

That is,

*STEP*2: Locate '_' in ⎕*AV* (*NOTE*: this is superfluous since we already know the location to be *HEX*'3D' = 61).

In the translate table, the position *HEX*'3D' shows a 2×1 element matrix, 109 152.

The first row element, *HEX*'6D' = 109, directly indexes into the *APLFULL BUFFER LOAD* and causes the graphic *APL* '_' (underscore) to be printed.

The second row element, 152, indexes back into ⎕*AV* again, addressing the *APL* character ' ' (space).

Return to *STEP*1.

Does the procedure ever terminate?

Yes it does, with the first generation of the space character, *HEX*'40' = 64, appearing in the *BUFFER LOAD*, or in other words, with the first occurence of the index 152 as a second row element in the matrix representation of the *BUFFER LOAD*, or, after at most ten occurences of *STEP*1, whichever is less.

One sees that *APL* graphics also appearing in the graphic set of the *APLFULL* print train are most easily generated, the second row element of the 2×1 matrix in the translate table always being a 152 = *HEX*'98'.

In the example shown, included here for purposes of illustration only, *APL* characters with no graphic representation are printed as a space character, except the *NCR* character (no carriage return character, or, equivalently, *EOB*, end-of-block) which is treated as an illegal character, and the line control characters, line feed, upper and lower case backspace, carriage return and the idle character, which are handled in a special way by the

SHARP APL FILEPRINT software and are required to have the matrix representations shown in order to act properly.

This completes our discussion of the translate table concept.

Support programs for the design of translate tables are available in the *APL WORKSPACES 3 HSPRINT* on *APLSV* and *SHARP APL*, as well as translate tables for mapping *APL* character codes to print train graphics on the *PN*, *TN-STND*, *APL* and *APL/ATS* buffer loads.

Moreover, the case of print requests submitted to the System/360 line printer from *APLSV* is somewhat different in the handling of line control characters since these requests are made through normal HASP procedures. Please refer to the documentation in the *APLSV WORKSPACE 3 HSPRINT* for further details on this.

CHART I
⎕AV, APL ATOMIC VECTOR

MOST SIGNIFICANT HEX DIGIT

LEAST SIGNIFICANT HEX DIGIT

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	IDL	(	⌊	!	∘	⊣	K	Δ	P̲	4	[illegible]					
1		)	|	⌽	⎕	⊢	L	A̲	Q̲	5						
2		;	∧	⊥	⍞	⍕	M	B̲	R̲	6	UBS					
3		/	∨	⊤	⍟	⍎	N	C̲	S̲	7						
4	$	\	<	○	⍲		O	D̲	T̲	8						
5	¢	←	≤	?	⍱		P	E̲	U̲	9						
6		→	=	~	⍝	A	Q	F̲	V̲	.						
7			≥	↑	⍋	B	R	G̲	W̲	¯						
8			>	↓	⍒	C	S	H̲	X̲							
9		¨	≠	⊂	⊖	D	T	I̲	Y̲	'						
A		+	α	⊃	⌿	E	U	J̲	Z̲	:						
B		−	∊	∩	⍀	F	V	K̲	Δ̲	∇						
C		×	⍳	∪	⌹	G	W	L̲	0	CR						
D		÷	ρ	_	⍫	H	X	M̲	1	NCR						
E	[	*	ω	⍉	[illegible]	I	Y	N̲	2	BS						
F	]	⌈	,	⌶	¤	J	Z	O̲	3	LF						

**To be used for illustration only

CHART II
APL #7 BUFFER LOAD

MOST SIGNIFICANT HEX DIGIT

LEAST SIGNIFICANT HEX DIGIT

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0						&	−	α	λ				‾	¨		0
1	∘				A	J	/		a	j			*A*	*J*		1
2					B	K	S		b	k	s	ρ	*B*	*K*	*S*	2
3					C	L	T		c	l	t		*C*	*L*	*T*	3
4					D	M	U	ε	d	m	u		*D*	*M*	*U*	4
5					E	N	V		e	n	v		*E*	*N*	*V*	5
6					F	O	W		f	o	w		*F*	*O*	*W*	6
7					G	P	X		g	p	x		*G*	*P*	*X*	7
8					H	Q	Y	ι	h	q	y		*H*	*Q*	*Y*	8
9					I	R	Z		i	r	z	ω	*I*	*R*	*Z*	9
A					¢	!		:	[	∧	↑	⊤	∩			•
B					.	$	,	#	]	∨	↓	⊥	∪			•
C					<	*	%	@	⌈	≥	→	⊣	⊃			-
D					(	)	_	'	⌊	≤	←	⊢	⊂			'
E					+	;	>	=	×	∼	∇	⎕	○			
F					|	¬	?	"	÷	≠	∆	\	∘			
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

**To be used for illustration only

CHART III
UNPACKED TRANSLATE TABLE FOR ⎕AV

MOST SIGNIFICANT HEX DIGIT

LEAST SIGNIFICANT HEX DIGIT	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	23 152	77 152	141 152	90 152	207 152	188 152	210 152	175 152	215 61	244 152	174 54	64 152	64 152	64 152	64 152	64 152
1	23 152	93 152	79 152	206 33	190 152	189 152	211 152	193 61	216 61	245 152	64 152	64 152	64 152	64 152	64 152	64 152
2	64 152	94 152	154 152	187 152	190 153	139 64	212 152	194 61	217 61	246 152	22 152	64 152	64 152	64 152	64 152	64 152
3	64 152	97 152	155 152	186 152	206 30	138 64	213 152	195 61	226 61	247 152	64 152	64 152	64 152	64 152	64 152	64 152
4	91 152	191 152	76 152	206 152	154 54	124 152	214 152	196 61	227 61	248 152	64 152	64 152	64 152	64 152	64 152	64 152
5	74 152	173 152	157 152	111 152	155 54	80 152	215 152	197 61	228 61	249 152	64 152	64 152	64 152	64 152	64 152	64 152
6	123 152	172 152	126 152	158 152	202 64	193 152	216 152	198 61	229 61	75 152	64 152	64 152	64 152	64 152	64 152	64 152
7	64 152	64 152	156 152	170 152	175 33	194 152	217 152	199 61	230 61	192 152	64 152	64 152	64 152	64 152	64 152	64 152
8	64 152	64 152	110 152	171 152	174 33	195 152	226 152	200 61	231 61	64 152	64 152	64 152	64 152	64 152	64 152	64 152
9	108 152	208 152	159 152	205 152	206 27	196 152	227 152	201 61	232 61	125 152	64 152	64 152	64 152	64 152	64 152	64 152
A	127 152	78 152	112 152	204 152	97 27	197 152	228 152	209 61	233 61	122 152	64 152	64 152	64 152	64 152	64 152	64 152
B	95 152	96 152	116 152	202 152	191 27	198 152	229 152	210 61	175 61	174 152	64 152	64 152	64 152	64 152	64 152	64 152
C	128 152	142 152	120 152	203 152	190 29	199 152	230 152	211 61	240 152	13 152	64 152	64 152	64 152	64 152	64 152	64 152
D	253 152	143 152	178 152	109 152	186 64	200 152	231 152	212 61	241 152	214 109	64 152	64 152	64 152	64 152	64 152	64 152
E	138 152	92 152	185 152	206 20	187 64	201 152	232 152	213 61	242 152	22 152	64 152	64 152	64 152	64 152	64 152	64 152
F	139 152	140 152	107 152	186 50	76 40	209 152	233 152	214 61	243 152	37 152	64 152	64 152	64 152	64 152	64 152	64 152
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

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UTCC COMPUTER EQUIPMENT

SYSTEM/370 MODEL 165-II

- located in SF103/105/112
- provides General Purpose Job Stream, High Speed Job Stream, APL SV and TSO services
- 4 megabytes of memory
- 1 drum (2301)
- 18 disk drives (3330)
- 9 disk drives (2314)
- 6 magnetic tape drives (4 9-track and 2 7-track)
- 6 display consoles
- 6 printers
- 5 card readers
- 1 card punch
- 8 remote batch terminals
- 1 paper tape reader
- Calcomp plotters (11" and 30")
- Gould plotter (11")
- OS/MVT with HASP

SYSTEM/360 MODEL 65

- located in McLennan Physical Laboratories
- provides APL and ATS services
- 1536K bytes of core
- 26 disk drives (2314)
- 3 9-track magnetic tape drives
- 1 printer
- 1 card reader
- 1 card punch
- 140 typewriter terminals
- OS/MVT with APL and ATS

COMPUTER RESEARCH FACILITY

- located in SF207
- DEC GT44 System with
  - 1 PDP-11/40 CPU
  - 2 RK05 disk drives
  - 2 9-track dual density tape drives
  - 1 1000 cpm card reader
  - 1 300 lpm line printer
  - 1 220 lpm lower case line printer
  - 1 paper tape reader/punch
  - VT11 graphics display unit
  - Lab. peripheral system with A/D and D/A
  - 1 Digitizing Tablet (20" by 20")
  - 1 ZETA incremental plotter (11")
  - 1 CVI 260 Video Bandwidth Compressor
  - 1 CVI 261 Video Bandwidth Expander
- DEC GT40 System with
  - 1 PDP-11/05 CPU
  - 3 DIABLO disk drives (RK05 type)
  - 1 9-track/800 BPI tape drive
  - VT11 graphics display unit
  - 1 Digitizing Tablet (20" by 20")
  - Card reader and line printers shared with GT44

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[illegible]S CODES		
Gail Cavers	EA206	8703
MANAGER, INFORMATION SYSTEMS		
Sean Keeley		3579

NOTE:

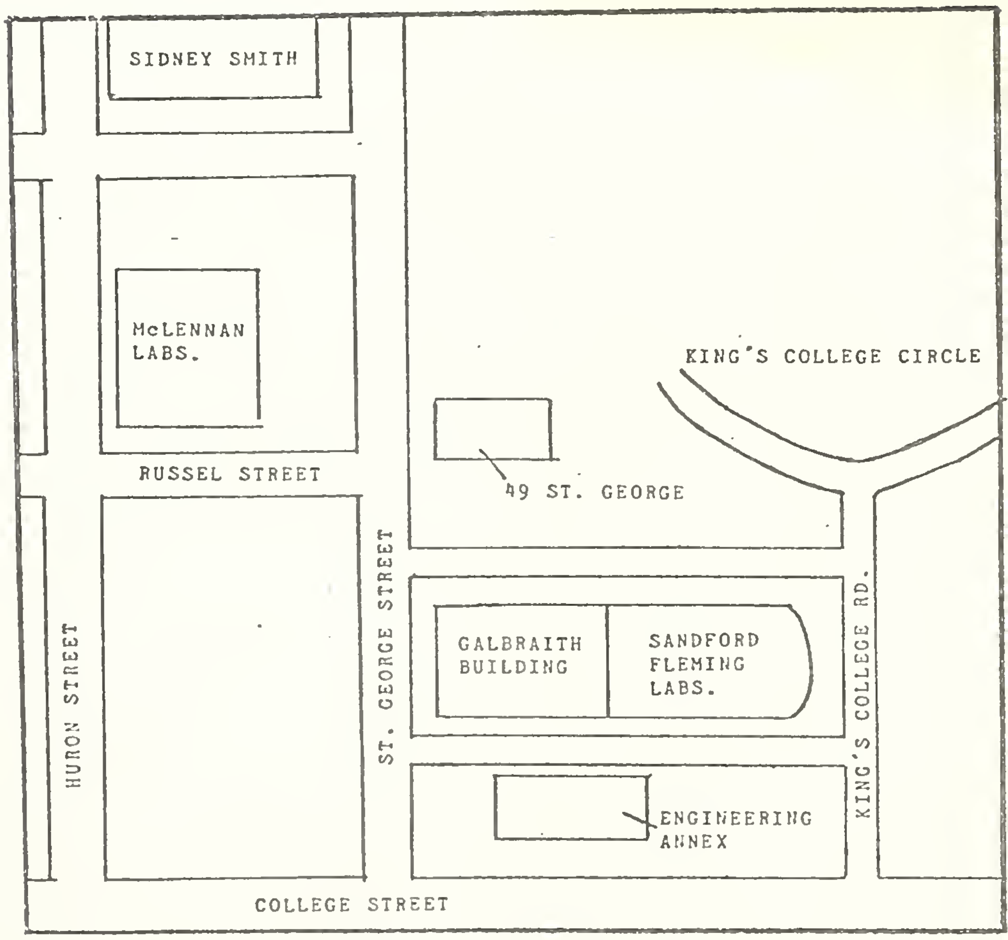
EA = Engineering Annex
SF = Sandford Fleming
SG = 49 St. George
NP = McLennan Physical (New Physics)
SS = Sydney Smith

JOB AND SYSTEM STATUS QUERIES

SYSTEM/370,TSO	7373
ATS/APL	6234
2741 TERMINAL MALFUNCTIONS	7107
029 KEYPUNCH MALFUNCTIONS	6465

SERVICES

	DIAL-UP	ADVICE
APL - 2741	7200	6710
APL(ASCII	7200	6710
APL SV - 2741	7239	6710
APL SV - TTY	7447	6710
ATS	7100	7107
TSO - 2741	7303	8599
TSO - TTY (10 cps)	7390	8599
TSO - TTY (30 cps)	7386	8599
DATATALK	6710	6710



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